

REMARKS

This paper is responsive to an Office Action mailed on November 1, 2006. Claims 1-13 and 15-21 were pending prior to this response. After amending claims 1 and 21, claims 1-13 and 15-21 remain pending.

In Section 3 of the Office Action claims 1-11, 13, 17, 20, and 21 have been rejected under 35 U.S.C. 102(e) as anticipated by Ozawa (US 6,781,762). The Office Action states that Ozawa discloses an isotropic wet etch process, that etches the hard mask faster than the transparent material, citing col. 15, ln. 3-6 and 13-14. This rejection is traversed as follows.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Beginning at col. 15, ln. 3, Ozawa states,

Subsequently, as shown in FIG. 12(c), the first film 220' and the transparent plate member 210a are wet-etched with an etchant of hydrofluoric acid type, or the like through the mask 612 which is provided with such pits 612a. Then, the first film 220' is etched faster because the etching rate of this first film 220' for the etchant is higher than that of the transparent plate member 210a. More specifically, before the etching penetrates through the first film 220', spherical recesses are excavated in the parts of the first film 220' around the pits 612a by the wet etching which has no directionality, but after the penetration, the first film 220' is etched faster. Therefore, the etching spreads sideways faster than in the depthwise direction of the pits 612a, that is, side etching proceeds relatively much, so that recesses

220a each being in the shape of a pan of shallow bottom are excavated around the pits 612a.

The above-quoted section describes the difference between the etch rate of first film 220' and the transparent plate 210. This section does not address the issue of etching the hard mask 612. That is, the above-quoted section does not state that the hard mask 612 is etched faster than the transparent material. In fact, Figs. 12c and 12d clearly show that the first film 220' and transparent plate 210 are etched at a rate faster than the hard mask 612, since the recesses in films 220' and 210 undercut the hard mask 612.

Ozawa discloses a hard mask 612 that is a temporary structure used for etching. The Examiner appears to treating the first film 220' as a second layer of hard mask. The Applicant notes that a hard mask is well known in the art as a temporary structure used in selective etching, Ozawa's transparent film 220' is part of the permanent structure (see Fig. 12f). The Applicant respectfully submits that if film 220' was a hard mask, Ozawa would have labeled it as such. The Applicant requests that the term "hard mask" be given the meaning ascribed to it by persons skilled in the art.

However, to further clarify the invention description, claims 1 and 21 have been amended to recite that the hard mask is removed after the lens is formed. Even if Ozawa first film 220' could be interpreted to be a hard mask, Ozawa's first film is not removed after wet etching.

Therefore, with respect to both claims 1 and 21, Ozawa fails to disclose a hard mask that is wet etched at a rate faster than the transparent substrate. Further, if Ozawa's first film is interpreted to be a "hard mask", Ozawa fails to disclose a "hard mask" (first film) being

removed after wet etching. Since Ozawa does not disclose all the limitations of claim 1, he cannot anticipate. Claims 2-11, 13, 17, and 20, dependent from claim 1, all enjoy the same distinctions from the cited art.

With respect to claim 21, Ozawa additionally fails to disclose a hard mask that is laterally etched to expose an underlying area of transparent material. As noted above, Ozawa's Figs. 12c and 12d show the opposite. Since Ozawa's hard mask is etched at a rate slower than transparent layers 220' and 210, rather than exposing these layers, the hard mask is undercut by transparent layers 220' and 210.

Since claims 1-11, 13, 17, and 20-21 are not anticipated by Ozawa, the Applicant requests that the rejection be removed.

In Section 5 of the Office Action claim 12 has been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Ozawa in view of Hawkins et al. ("Hawkins"; US 6,211,916). The Office Action acknowledges that Ozawa does not teach planarizing using a CMP process. The Office Action states that Hawkins discloses such a process, and that it would have been obvious to modify Ozawa in light of Hawkins, with the motivation being "to planarize the lens material optically flat." This rejection is traversed as follows.

An invention is unpatentable if the differences between it and the prior art would have been obvious at the time of the invention. As stated in MPEP § 2143, there are three requirements to establish a *prima facie* case of obviousness.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of

success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck* 947 F.2d 488, 20 USPQ2d, 1438 (Fed. Cir. 1991).

At col. 5, ln. 25-26, Hawkins mentions that "the lens material 130 is planarized optically flat, preferably by chemical mechanical polishing." This sentence is Hawkins' complete teaching on the subject.

With respect to the first *prima facie* requirement, the Office Action has failed to provide a case to support the assumption that an expert in the art would be motivated to modify Ozawa in view of Hawkins. For example, it is not clear that a CMP process is even possible to perform on Ozawa's structure, since Ozawa's transparent layer is actually a bilayer of transparent materials (220'/210), and the top layer 220' is relatively thin. Further, it is unknown if Ozawa's material 500 can be polished. Finally, it cannot be determined if it is even desirable to polish Ozawa's lens material 500, as Ozawa states that microlens 500 has a slight spherical aberration to more efficiently utilize incident light (col. 14, ln. 1-5).

The legal concept of *prima facie* obviousness is a procedural tool of examination which applies broadly to all arts. It allocates who has the burden of going forward with production of evidence in each step of the examination process. See *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *In re Linter*, 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Saunders*, 444 F.2d 599, 170 USPQ 213 (CCPA 1971); *In re Tiffin*, 443 F.2d 394, 170 USPQ 88 (CCPA 1971), *amended*, 448 F.2d 791, 171 USPQ 294 (CCPA 1971); *In re Warner*, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967), *cert. denied*, 389 U.S. 1057 (1968).

The CAFC has consistently found over the years that a *prima facie* case for obvious must be based upon a detailed analysis of how and why an expert could excerpt known art to make modifications to a cited prior art reference. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art reference for combination in the manner claimed." *In re Rouffet*, 47 USPQ2d 1453, 1457-1458 (1998).

In the present case, the Applicant submits that it is impossible to support a *prima facie* case of obviousness based upon the statement that it would have been obvious to modify Ozawa in light of Hawkins, with the motivation being to planarize the lens material optically flat.

With respect to the second *prima facie* requirement, no evidence has been provided that there is an expectation of success, even if an expert were given the two disclosures as a foundation. In fact, both the Hawkins and Ozawa references teach that a hard mask (110 Hawkins, 612 Ozawa) has greater selectively (is less susceptible) to a wet etch than the underlying transparent material. Since neither reference suggests the limitation of etching the hard mask faster than the underlying transparent material (as recited in the claimed invention), the combination of references cannot be said to suggest such a limitation.

With respect to the third *prima facie* requirement, even if the references are combined, they do not explicitly disclose or suggest all the limitations of claim 1. As noted above in response to the anticipation rejection, Ozawa's first film 220' is not a hard mask, and Ozawa does not disclose a hard mask that is etched faster than the underlying

transparent material. Likewise, in Fig. 3F Hawkins clearly shows that the underlying transparent material 100 is wet etched at a rate faster than the hard mask material 110, in order to form depressions 120 (col. 4, ln.63, through col. 5, ln. 6). Therefore, the combination of Hawkins and Ozawa does not explicitly describe all the limitations of claim 1, or suggest modifications that would make the missing limitations obvious. Claim 12, dependent from claim 1, enjoys the same distinctions from the cited references, and the Applicant respectfully requests that the rejection be withdrawn.

In Section 6 of the Office Action claim 15 has been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Ozawa in view of Rhodes (US 6,307,243) and Yamamoto (US 2004/0082094). The Office Action acknowledges that Ozawa does not disclose a TEOS first film 220', as Rhodes, or a thermal oxide transparent material, as does Yamamoto. The Office Action state that is would have been obvious to combine the teachings of the three references, with the motivation being to form a TEOS first film for improved conformal deposition, and to form a thermal oxide by blanket deposition.

With respect to the first and second *prima facie* requirements, no evidence has been supplied that it is possible or desirable to modify Ozawa in light of the Rhodes and Yamamoto disclosure. With respect to the third *prima facie* requirement, even if the references can be combination the combination does not explicitly describe or suggest the limitation of a hard mask with an etch rate greater than the underlying substrate, which is removed after the wet etch process, as recited in claim 1. Claim 15, dependent from claim 1, enjoys the same

distinctions from the cited prior art, and the Applicant requests that the rejection be removed.

In Section 7 of the Office Action claim 16 has been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Ozawa in view of Hawkins and Tsunetomo et al. ("Tsunetomo"; US 2003/0157211). The Office Action acknowledges that Ozawa and Hawkins do not disclose a doped first film 220', as Tsunetomo. The Office Action states that it would have been obvious to combine the teachings of the three references, with the motivation being that the etching can be shaped.

With respect to the first and second *prima facie* requirements, no evidence has been supplied that it is possible or desirable to modify Ozawa to perform shaped etching. With respect to the third *prima facie* requirement, even if the references can be combined the combination does not explicitly describe or suggest the limitation of a hard mask with an etch rate greater than the underlying substrate, which is removed after the wet etch process, as recited in claim 1. Claim 16, dependent from claim 1, enjoys the same distinctions from the cited prior art, and the Applicant requests that the rejection be removed.

In Section 8 of the Office Action claims 18 and 19 have been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Ozawa in view of Tsunetomo. The Office Action acknowledges that Ozawa does not disclose a layer of transparent material with the overlying layers having a faster etch rate than the underlying layers. The Office Action states that Tsunetomo discloses such a feature and that the motivation to combine references would be to form a lens having an aspherical shape.

In response, the Applicant notes that Ozawa clearly describes the first layer 220' as transparent (col. 14, ln. 50-55), having a

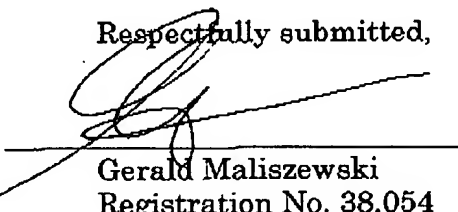
faster etch rate than the underlying transparent layer 210 (col. 15, ln. 5-18). Therefore, the stated basis for combining these two references is flawed. Further, even if the stated basis was not flawed, no evidence has been supplied (first and second *prima facie* requirements) that it is possible or desirable to modify Ozawa in light Tsunetomo.

With respect to the third *prima facie* requirement, even if the references can be combined, the combination does not explicitly describe or suggest the limitation of a hard mask with an etch rate greater than the underlying substrate, which is removed after the wet etch process, as recited in claim 1. Claims 18 and 19, dependent from claim 1, enjoy the same distinctions from the cited prior art, and the Applicant requests that the rejection be removed.

It is believed that the application is in condition for allowance and reconsideration is earnestly solicited.

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Respectfully submitted,


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